PATENT SPECIFICATION

1,163,203

DRAWINGS ATTACHED

1,163,203

Date of Application (No. 8807/67) and filing Complete Specification: 24 Feb., 1967.

Application made in France (No. 52,691) on 9 March, 1966.

Complete Specification Published: 4 Sept., 1969.

Index at acceptance:—B8 T(2C, 3B, 4F, 7C1, 7F1, 7F2, 7F3, 9A, 9X)

International Classification:—B 65 d 41/48

COMPLETE SPECIFICATION

ERRATUM

SPECIFICATION NO 1163203

Page 3, line 98, *for* have *read* having

THE PATENT OFFICE
6 December 1972

R 14364/18

PATENTS ACT 1949

SPECIFICATION NO 1163203

In accordance with the Decision of the Superintending Examiner, acting for the Comptroller-General, dated 22 February 1972 this Specification has been amended under Section 14 in the following manner:-

Page 1, lines 41 and 42, *delete* thermosetting *insert* thermoplastic

Page 1, line 59, page 3, line 125, *delete* by one or more *insert* at intervals around the stopper by

Page 1, lines 60 and 61, page 2, lines 16 and 17, page 3, lines 126 and 127, page 4, lines 23 and 24, *delete* or tack welds which are easily destroyed by pulling

Page 1, *delete* lines 69 and 70, *insert* Preferably, one or more security lugs are also provided. When the security lugs and the tangible nibs

Page 1, line 88, *delete* one or both nibs, *insert* the nib.

Page 2, line 97, *delete* or tack welds

Page 2, line 98, *delete* either

Page 2, *delete* lines 99 and 100 *insert* stopper. These nibs 13 which

Page 2, line 112, *delete* or welds

Page 2, line 117, *delete* or

Page 2, *delete* line 118

Page 4, line 8, *delete* sealing tab *insert* security lug

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6 December 1972

R 14364/19

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International Classification:—B 65 d 41/48

COMPLETE SPECIFICATION

Improvements relating to stoppers for the mouths of Necked Containers

We, CAPTOCAP LIMITED, a Company organised under the laws of Liechtenstein of Vaduz, Liechtenstein, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to stoppers for the mouths of necked containers.

In certain stoppers as hitherto made in a resiliently deformable plastics material, an external retaining band constituted by a lower annular section of a relatively deep external skirt has normally been connected around at least the greater part of its periphery to an upper annular section by a tear strip. The tear strip thus formed a continuous secure connection between the upper and lower annular sections of the skirt until deliberately removed to permit opening of the stopper. After removal, the upper section of the skirt overlaps the rim of the mouth when the stopper is closed and can provide a leakproof seal around the neck below the rim.

An internal skirt or plug has sometimes been provided on such stoppers for sealing against the internal wall of the neck when the stopper is closed. The efficiency of the sealing action of the external and internal skirts has also been improved by the provision of annular ribs around the skirts, and one or more coacting annular shoulders on the external wall of the neck have been proposed to increase the security of the stopper when closed, or to act as abutments for retaining the lower section of the skirt and preventing its detachment from the neck of the container in normal use, or both.

Tear strips as hitherto proposed, however, are not practicable as security devices when the stopper is required to be made from thermosetting materials such as polypropylene, because although such materials have the advantage of being sterilisable and heat-resistant, they do not tear easily and are often brittle. One object of the present invention is to overcome this difficulty without sacrificing the security and leakproof sealing properties.

According to the present invention there is provided a container stopper made of a plastics material which does not tear easily comprising a cap provided with an internal skirt and an external skirt spaced apart and arranged substantially parallel to one another to form a channel for elastic engagement over the neck of a container wherein the external skirt is divided into two superimposed sections by at least one annular gap or split, the two sections being interconnected by one or more easily frangible nibs or tack welds which are easily destroyed by pulling and wherein both the upper section and the lower section of the external skirt have an inwardly projecting annular rib adapted when the stopper is in use to be located below an annular shoulder on the container neck, the arrangement being such that the cap may be firmly replaced after being removed.

Preferably, several frangible nibs or lugs are provided and when these frangible nibs or lugs have been broken the cap and its integral upper skirt section may be swung into open position on a hinge or lifted bodily clear of the mouth of the container.

Preferably, the peripheral split is bridged at one point by a hinge piece which enables the cap and its integral outer skirt to be swung away from the mouth of the container neck as described above. This bridging hinge piece can be separately secured to the upper and lower skirt sections across the line of the peripheral split, or may be constituted by a discontinuous zone of the split.

Advantageously, each frangible nib constitues a point of attachment of a lug to the respective skirt section so that the sections can be separated by gripping the lug and fracturing one or both nibs.

The invention also includes a container stopper made of a plastics material which does not tear easily comprising a cap provided with an internal skirt and an external skirt spaced apart and arranged substantially parallel to one another to form a channel for elastic engagement over the neck of a container wherein the external skirt is divided into two superimposed sections separated from one another by a peripheral tear band which is separated from the upper skirt section by an upper peripheral gap or split and from the lower skirt section by a lower peripheral gap or split, the two peripheral gaps or splits being bridged at intervals around the periphery of the stopper by frangible nibs or tack welds which are easily destroyed by pulling and wherein both the upper section and the lower section of the external skirt have an inwardly projecting annular rib adapted when the stopper is in use to be located below an annular shoulder on the container neck the arrangement being such that the cap may be firmly replaced after being removed.

The cap may also have a leak-resistant sealing formation on its underside between the above-mentioned inner and outer skirts which coacts with the rim of the mouth when the stopper is in its closed position.

Practical embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:—

Figure 1 is a diametral section through a container neck and a stopper mounted thereon in the closed position;

Figure 2 is a plan view of Figure 1;

Figure 3 is a side elevation of Figure 2;

Figure 4 is a view similar to Figure 3 but on a smaller scale showing a complete container with the stopper of Figures 1—3 in the closed position;

Figure 5 is a view similar to Figure 4 but showing the stopper in the open position;

Figure 6 is a view similar to Figure 3 of a modification, and

Figure 7 is a diametral section similar to Figure 1 of the modification of Figure 6.

Referring first to Figures 1—5 of the drawings, a stopper for a necked container has a cap 1 with a slightly recessed flat central portion and an integral upper outer skirt section 2 which releasably embraces the neck of a bottle or like container 10. A narrow gap or split 3 separates the upper outer skirt section 2 from a lower annular section 4 which is designed to be resiliently deformed over a lower shoulder 9 around the external wall of the container neck, and to be retained by the shoulder after it has been forced thereover.

The cap 1 has an integral inner skirt 5 which is a snug leak-resistant fit within the container neck when the stopper is closed, and on the underside of the cap, in the annular zone or channel between the inner and outer skirts, is formed a resiliently deformable annular sealing rib 6 which is adapted to engage the rim of the mouth when the stopper is closed so as to provide a second leak-resistant barrier to the escape of any fluid from the container 10 which may succeed in passing the inner skirt 5.

The internal wall of the upper outer skirt section 2 has a larger leak-resistant rib 7 formed around its periphery in a position in which it engages the underside of a complementary annular upper shoulder 8 on the outside of the container neck, the coacting surfaces of the rib 7 and ridge 8 being inclined so as to promote a downward wedge action on the skirt which tends to compress the annular seal 6 against the rim of the mouth. As shown in Figure 1, the inner skirt 5 has a similar external rib 11 which engages the internal wall 12 of the neck substantially opposite the rib 7, so that the stopper provides three leak-resistant zones at *a*, *b* *c* in series in the path of any fluid tending to leak from the container 10. Clearance spaces *d*, *e* between adjacent pairs of seals break the continuity of any possible capillary path between the cap and the neck of the container.

The gap or split 3 between the upper and lower outer skirt sections 2, 4 is initially bridged at several equidistantly spaced points around the circumference of the outer skirt by frangible nibs or tack welds 13 which are either moulded during the moulding of the stopper or applied subsequently by a "tack" welding step. These nibs or welds 13 which bridge the gap or split 3 hold the upper and lower skirt sections 2, 4 together for the initial purpose of ensuring that the skirt behaves as a single unit when the stopper is being initially applied to the neck of the container, which is achieved by axially pressing the stopper onto the neck by a force sufficient to stretch the lower annular skirt section 4 over the lower shoulder 9 while at the same time forcing the third leak-resistant sealing rib 7 over the upper shoulder 8 on the neck.

The frangible nibs or welds 13 are further reinforced by safety lugs 17 which bridge the gap or split 3 and are secured to the upper and lower sections 2, 4 of the outer skirt by frangible nibs 18 which may similarly be formed during moulding of the stopper or subsequently by a tack or spot-welding step. The safety lugs 17 provide an additional security against the risk of accidental or unintentional release of the stopper during transit of a filled container or initial handling by the customer.

As a further precaution against accidental or unintentional breakage of the mechanical seal between the upper and lower skirt portions 2, 4, a further and similarly secured safety lug 20 is located beneath a finger grip 19 for raising the cap 1 to open the stopper.

At one zone around its periphery the gap

or split 3 is interrupted by a hinge structure comprising a pair of short strips 14 integral with the upper and lower skirt sections 2, 4. The strips 14 are united at their upper ends by a yoke portion 15 of the upper skirt section 2, the yoke 15 and strips 14 being flanked by slots or cutaways 16 in the upper skirt section 2 to provide the necessary effective length of the hinge connection to ensure the required flexibility.

To open the stopper described above, the user first breaks off the safety lugs 17, 20 and then prises up the cap 1 and upper outer skirt section 2 by means of the finger grip 19. This applies a breaking load to the nibs 13, which thereupon fracture and leave the upper skirt section free to separate from the annular lower retaining section 4 at the gap or split 3. On reclosure of the stopper, the three leak-resistant seals at *a*, *b*, *c* are reformed and the cap 1 is held tightly closed down on the rim of the mouth by the wedge action between the sealing rib 7 and the coacting ridge 8.

Figures 1 and 4 further illustrate the use of a stay or steady 21 for holding the stopper in the open position shown in Figure 5. This stay or steady is constituted by a stiff tongue projecting downwards from the underside of the cap 1 close to the internal wall of the inner skirt 5 above the zone of the hinge 14, 15 and adapted to rest on the rim of the mouth as shown in Figure 5.

An annular interlock enlargement or rib 22 is shown in Figure 1 around the internal surface of the lower retaining section 4 of the outer skirt adjacent the gap or split 3 to engage beneath the shoulder 9 so as to prevent detachment of this skirt section from the container neck once the stopper has been pressed into position on the neck. Consequently, until the frangible nibs 13 and lugs 17, 20 have been broken as described above, the stopper is held securely closed on the neck of the container and all three leak-resistant seals remain operative to prevent leakage of the contents, especially where these are volatile or have a high creep coefficient.

Figures 6 and 7 of the drawings illustrate a modified construction of stopper. As in the construction described with reference to Figures 1—5, the stopper comprises a cap proper with flat top 1 having an external skirt 2 and an internal skirt 5; opposed peripheral ribs 7 and 11 ensure the fluid-tightness of the cap on the mouth and neck of the container 10 below the rim 8 and a circular peripheral rib 6 on the inside of the top of the cap 1 bears on the mouth of the container.

In this modification, the upper and lower outer skirt sections 2, 4 are separated by an intermediate tear strip in the form of a peripheral band 25 having a finger grip 26 to facilitate its removal. The single gap or split 3 of Figures 1—5 is now replaced by two such gaps or splits 3 along either boundary of the band 25, the band 25 being separated from the upper skirt section by an upper peripheral gap or split 3 and being separated from the lower skirt section by a lower peripheral gap or split 3. The initial mechanical security of the skirt sections is provided by nibs 13 at intervals around the upper boundary which serve to connect the band to the upper skirt section 2 whilst corresponding nibs 23 interconnect the band to the lower skirt section 4 at the same intervals around the lower boundary of the strip. Both sets of nibs 13, 23 are broken when the band is removed, thus freeing the upper skirt section 2 and integral cap 1 for opening of the container 10.

Although the upper and lower skirt sections 2, 4 can be connected by a hinge similar to that shown at 14, 15 in Figures 1—5, the construction illustrated in Figures 6 and 7 has a screw thread 27 around the neck of the container which is engaged by a complementary screw thread 24 around the internal wall of the upper skirt section 2. In such an arrangement, removal of the tear strip 25 completely frees the upper skirt section 2 from the lower section 4.

In both embodiments illustrated, the gap or split 3 in the outer skirt structure is located below the sealing rib 7 on the upper outer skirt section 2 so that the stopper always presents three seals in series against leakage of the contents of the container 10.

Obviously, stoppers have other methods of engagement with the neck of a container 10 — such as a bayonet catch formation in place of the screw threads 24, 27 — can be made in accordance with the present invention.

The cap 1 can also be of other configuration than flat as shown in the accompanying drawings.

In all embodiments of the present invention, however, the provision of a gap or split 3 representing an almost complete severance of the upper and lower outer skirt portions 2, 4 permits the use of more brittle or tear-resistant materials such as polypropylene, so that advantage can be taken of their other desirable characteristics such as heat resistance and sterilisability.

WHAT WE CLAIM IS:—

1. A container stopper made of a plastics material which does not tear easily comprising a cap provided with an internal skirt and an external skirt spaced apart and arranged substantially parallel to one another to form a channel for elastic engagement over the neck of a container wherein the external skirt is divided into two superimposed sections by at least one annular gap or split, the two sections being interconnected by one or more easily frangible nibs or tack welds which are easily destroyed by pulling and wherein both the upper section and the lower section of the external skirt have an inwardly projecting annular rib adapted when the stopper is in use to be

located below an annular shoulder on the container neck, the arrangement being such that the cap may be firmly replaced after being removed.

2. A container stopper according to claim 1 wherein the two sections of the external skirt are in addition interconnected by at least one sealing tab which can be pulled off.

3. A container stopper made of a plastics material which does not tear easily comprising a cap provided with an internal skirt and an external skirt spaced apart and arranged substantially parallel to one another to form a channel for elastic engagement over the neck of a container wherein the external skirt is divided into two superimposed sections separated from one another by a peripheral tear band which is separated from the upper skirt section by an upper peripheral gap or split and from the lower skirt section by a lower peripheral gap or split, the two peripheral gaps or splits being bridged at intervals around the periphery of the stopper by frangible nibs or tack welds which are easily destroyed by pulling and wherein both the upper section and the lower section of the external skirt have an inwardly projecting annular rib adapted when the stopper is in use to be located below an annular shoulder on the container neck the arrangement being such that the cap may be firmly replaced after being removed.

4. A plastics stopper according to any of the preceding claims wherein the upper external skirt section is permanently connected to the lower external skirt section by a hinge which bridges the peripheral gap or gaps and wherein security lugs are located between the frangible nibs, one diametrically opposite the hinge and another on a diameter at right angles thereto.

5. A plastics stopper according to any of the preceding claims wherein a steady is provided on the internal skirt to form an abutment to hold the cap in the open position.

6. A plastics stopper according to any of the preceding claims wherein the upper part of the external skirt is threaded above the peripheral gap or split to match complementary screw threads on the neck of the vessel.

7. A plastics stopper substantially as hereinbefore described with reference to Figures 1 to 5 of the drawings.

8. A plastics stopper substantially as hereinbefore described with reference to Figures 6 and 7 of the accompanying drawings.

WITHERS & SPOONER,
Chartered Patent Agents,
148—150, Holborn,
London, E.C.1.,
Agents for the Applicants.

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1163203 COMPLETE SPECIFICATION

3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

Fig. 1.

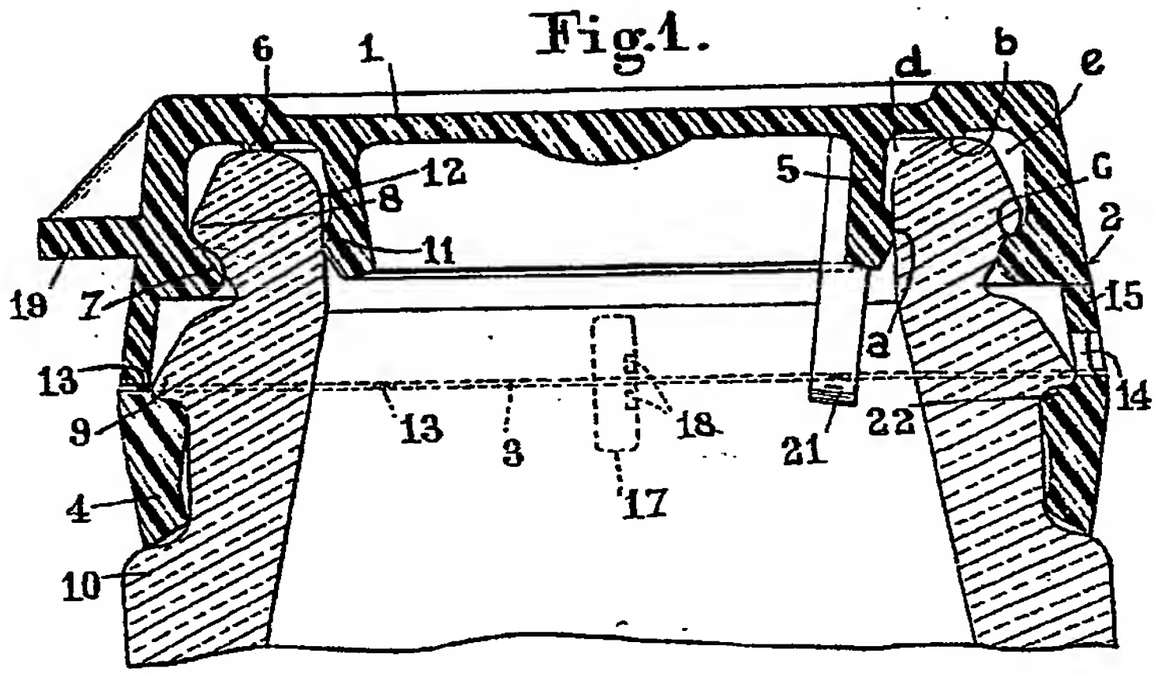
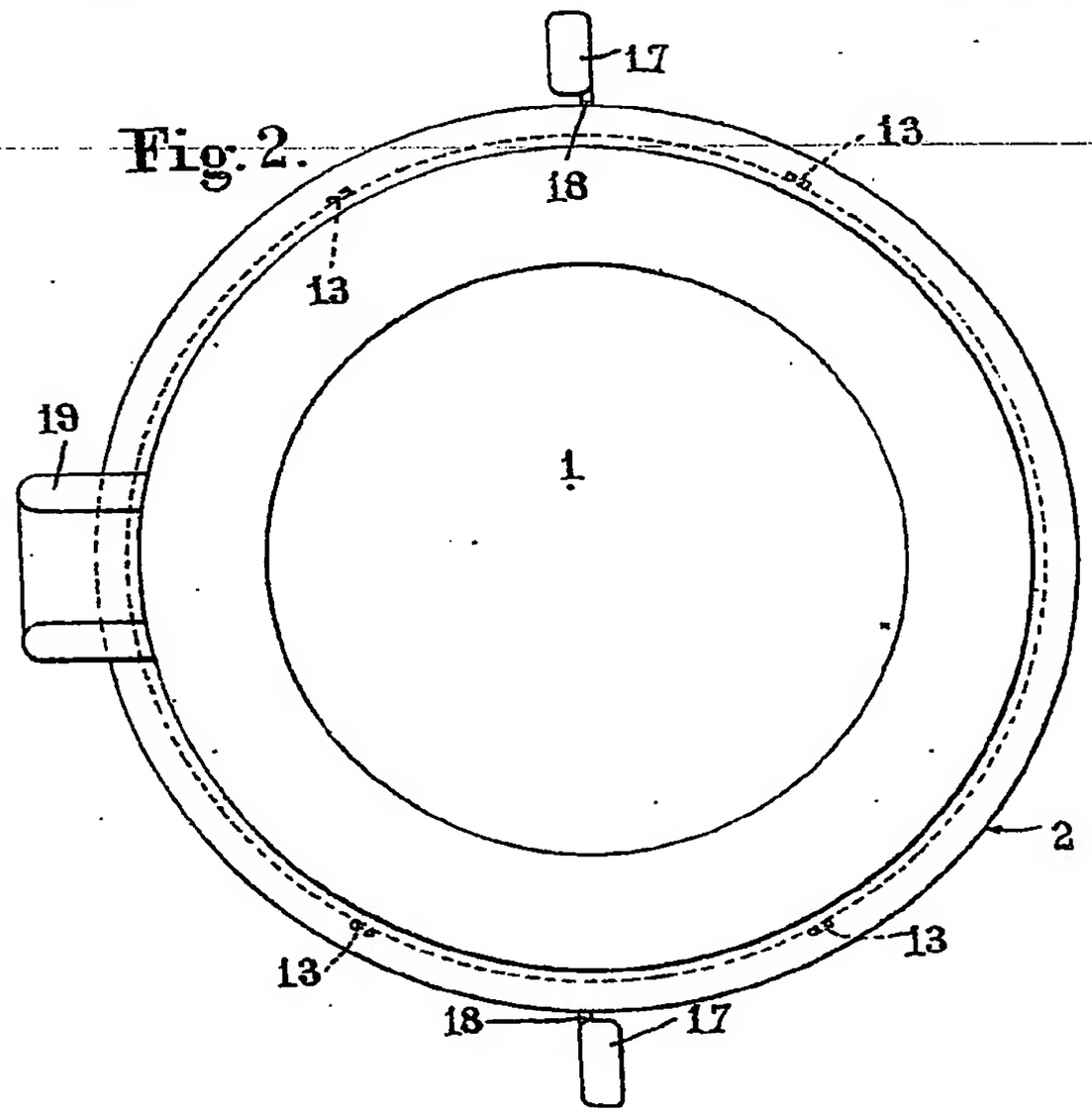


Fig. 2.



1163203 COMPLETE SPECIFICATION
3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

Fig.3.

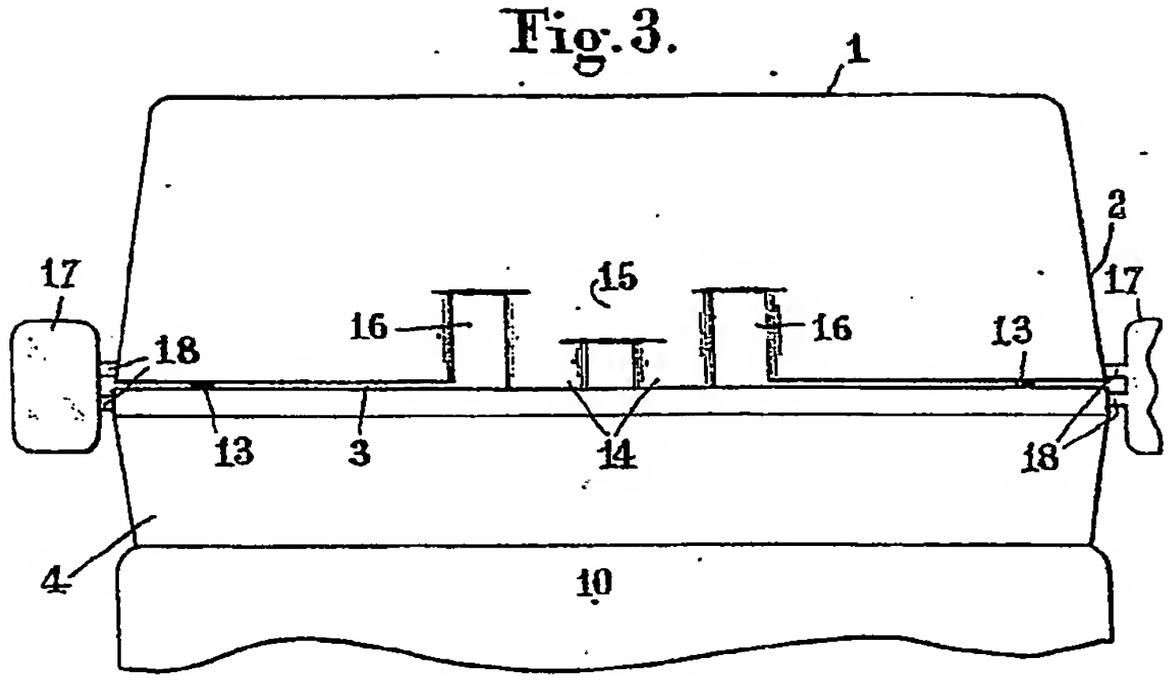


Fig.4.

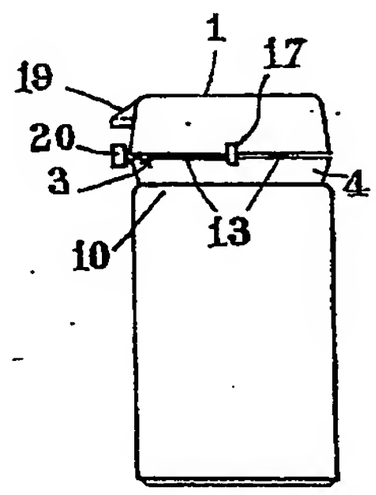
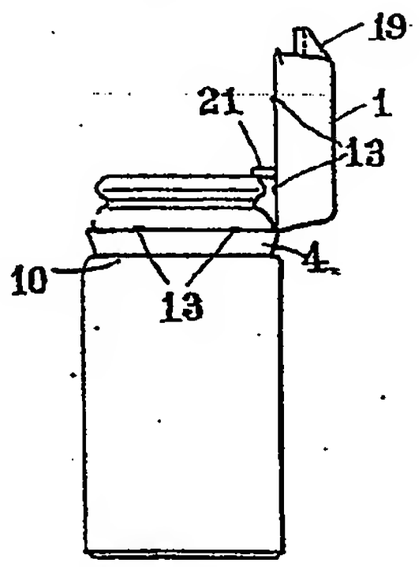


Fig.5.



1163203 COMPLETE SPECIFICATION
3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 3

Fig. 6

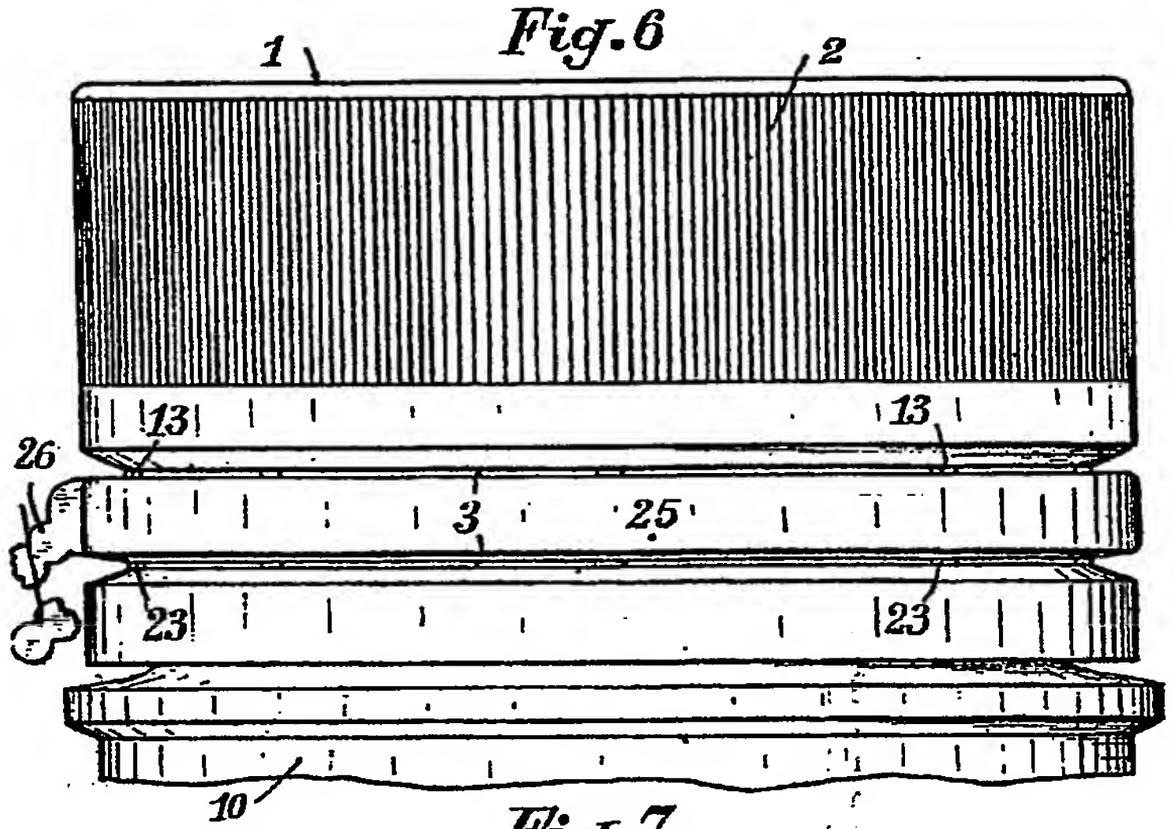


Fig. 7